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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,389	07/03/2001	Zhaocheng Wang	450117-03249	3617
20999	7590	09/21/2005	EXAMINER	
FROMMER LAWRENCE & HAUG 745 FIFTH AVENUE- 10TH FL. NEW YORK, NY 10151			TSEGAYE, SABA	
			ART UNIT	PAPER NUMBER
			2662	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/898,389

Applicant(s)

WANG ET AL.

Examiner

Saba Tsegaye

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>07/03/01</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: claim numbers indicated on page 2, line 34 and page 3, line 8, should be deleted.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak et al. (US 6,728,302) in view of Agrawal et al. (US 6,618,454).

Regarding claims 1, 7, and 13, Dabak discloses an encoding means 112 for encoding a data stream on the basis of a STTD scheme and outputting a first and a second STTD encoded data stream; a first and a second antenna means (Ant1 and Ant2) being arranged spaced apart from each other in a space diversity arrangement (column 2, lines 26-33); and pilot generating means (100, 102) for generating pilot symbols to be transmitted among the data of the first and the second data stream, whereby first pilot symbols are transmitted via the first antenna and second pilot symbols are transmitted via the second antenna (column 2, lines 45-59). However, Dabak does not expressly disclose transmitting the first and the second data stream, respectively, in OFDM signal.

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Agrawal teaches the principles of OFDM in combination with a plurality of transmitting antennas (column 2, lines 22-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use OFDM signal, such as that suggested by Agrawal, in the Dabak system. The motivation is that OFDM eliminates the requirement for guard bands to separate the frequencies and thereby avoid interference from adjacent RF channels.

Regarding claims 2, 4, 5, 9 and 14, Dabak discloses all the claim limitations as stated above. Further, Dabak discloses that the pilot symbols at leads 100 and 102 are applied to multiplex circuit 118. Multiplex circuit 118 selectively applies the pilot symbols at leads 100 and 102 to leads 120 and 122, respectively, at a time corresponding to pilot symbols. However, Dabak does not disclose transmitting the first and the second data stream, respectively, in OFDM signal.

Agrawal teaches the principles of OFDM in combination with a plurality of transmitting antennas (column 2, lines 22-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use OFDM signal, such as that suggested by Agrawal, in the Dabak system. The motivation is that OFDM eliminates the requirement for guard bands to separate the frequencies and thereby avoid interference from adjacent RF channels.

Regarding claims 3, 6, 10, 11 and 15, Dabak discloses all the claim limitations as stated above. Further, Dabak discloses that each pilot symbol includes bits representing a real and imaginary component. As shown in table 1, asterisks indicate a complex conjugate operation or

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sing change of the imaginary part of the symbol (column 3, lines 22-43). However, Dabak dose not disclose transmitting the first and the second data stream, respectively, in OFDM signal.

Agrawal teaches the principles of OFDM in combination with a plurality of transmitting antennas (column 2, lines 22-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use OFDM signal, such as that suggested by Agrawal, in the Dabak system. The motivation is that OFDM eliminates the requirement for guard bands to separate the frequencies and thereby avoid interference from adjacent RF channels.

Regarding claims 8, 12 and 16, Dabak discloses, in fig. 4, receiving device for receiving signal in a wireless system with space time transmit diversity comprising: a single antenna means (400) for receiving STTD encoded signals transmitted fro a first (Ant1) and a second (Ant2) space diversity antenna means of a transmitting device (fig. 1) of communication system, the first (Ant1) and the second (Ant2) space diversity antenna means transmitting corresponding pilot symbols in the STTD encoded signals, processing means (404) for detecting pilot symbols in the received STTD encoded signal, for processing detected pilot symbols and performing a channel estimation on the basis of the processing to separately determine the transmission quality of STTD encoded signal transmitted from the first (Ant1) and the second (Ant2) antenna means respectively (column 4, lines 25-57). However, Dabak dose not disclose transmitting the first and the second data stream, respectively, in OFDM signal.

Agrawal teaches the principles of OFDM in combination with a plurality of transmitting antennas (column 2, lines 22-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use OFDM signal, such as that suggested by Agrawal, in the

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Dabak system. The motivation is that OFDM eliminates the requirement for guard bands to separate the frequencies and thereby avoid interference from adjacent RF channels.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Baum et al. (US 5,867,478) disclose a synchronous coherent orthogonal frequency division multiplexing system.

Dabak et al. (US 6,643,338) discloses a space time block coded transmit antenna diversity for WCDMA.

Li et al. (US 6,795,392) discloses clustered OFDM with channel estimation.

Nilsson (US 6,853,689) discloses a method and apparatus for channel estimation with transmit diversity.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saba Tsegaye whose telephone number is (571) 272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ST  
September 15, 2005

A handwritten signature in black ink, appearing to read 'J. Pezzlo', with a stylized, cursive script.

**JOHN PEZZLO**  
**PRIMARY EXAMINER**